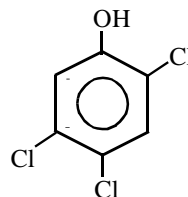


2,4,5-TRICHLOROPHENOL

2,4,5-Trichlorophenol is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 95-95-4

Molecular Formula: $C_6H_3Cl_3O$



2,4,5-Trichlorophenol is found as colorless needles or gray flakes with a strong phenolic odor. It sublimes, is stable up to its melting point, and is a weak monobasic acid. It is soluble in acetone, benzene, carbon tetrachloride, ether, denatured alcohol formula, methanol, liquid petrolatum, soybean oil, and toluene (Merck, 1989). 2,4,5-Trichlorophenol is insoluble in water. It emits toxic fumes of chloride and explodes when heated to decomposition (Sax, 1989).

Physical Properties of 2,4,5-Trichlorophenol

Synonyms: 2,4,5-TCP; Dowicide 2; Collunosol

Molecular Weight:	197.46
Boiling Point:	253 °C
Melting Point:	67 °C
Vapor Density:	1.678 at 25/4 °C (air = 1)
Vapor Pressure:	0.022 mm Hg at 25 °C
Log Octanol/Water Partition Coefficient:	3.72
Conversion Factor:	1ppm = 8.07 mg/m ³

(Howard; 1990; Merck, 1989; Sax, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

2,4,5-Trichlorophenol may be detected as an impurity in pesticides. It has been detected in the emissions from incinerators and can be formed in the environment as a hydrolysis product of 2,4,5-trichlorophenol esters (Howard, 1990).

2,4,5-Trichlorophenol was registered for use as a pesticide, however as of January 14, 1986, it is no longer registered for pesticidal use in California (DPR, 1996).

B. Emissions

No emissions of 2,4,5-trichlorophenol from stationary sources in California were reported, based on data obtained from the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

2,4,5-Trichlorophenol is not known to occur as a natural product (Howard, 1990).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of 2,4,5-trichlorophenol. The United States Environmental Protection Agency (U.S. EPA) has compiled ambient air data from Portland, Oregon and Columbia, South Carolina. The data reported mean concentrations of 0.15 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) or 0.02 parts per billion (ppb) in Portland during 1984 and 0.08 $\mu\text{g}/\text{m}^3$ or 0.01 ppb in Columbia in 1989 (U.S. EPA, 1993a).

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of 2,4,5-trichlorophenol was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

2,4,5-Trichlorophenol is expected to be less reactive towards the hydroxyl radical than are the dichlorophenols. Therefore, using the rate constants for the reactions of the hydroxyl radical with 2,3- and 2,4-dichlorophenol (Atkinson, 1989), the gas phase reaction with hydroxyl radicals is expected to lead to a half-life of at least 7 days (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

2,4,5-Trichlorophenol emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

The probable routes of human exposure to 2,4,5-trichlorophenol are inhalation, ingestion, and dermal contact (U.S. EPA, 1994a).

Non-Cancer: 2,4,5-Trichlorophenol is an eye and respiratory system irritant upon acute exposure in humans. No information is available on the chronic effects of exposure to 2,4,5-trichlorophenol in humans. In one study, rats chronically exposed to 2,4,5-trichlorophenol

in their diet were observed to develop slight degenerative changes in the liver and kidneys (U.S. EPA, 1994a).

The U.S. EPA has not established a Reference Concentration (RfC) for 2,4,5-trichlorophenol, but has set an oral Reference Dose (RfD) of 0.1 milligrams per kilogram per day based on liver and kidney pathology in rats. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely result in the occurrence of chronic, non-cancer effects (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects of 2,4,5-trichlorophenol in humans. No birth defects were observed in several studies of mice exposed by gavage to 2,4,5-trichlorophenol. In one study, a reduction in litter size was reported. No changes in fetal or maternal parameters were noted in rats exposed to 2,4,5-trichlorophenol by injection (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of 2,4,5-trichlorophenol in humans. The U.S. EPA has classified 2,4,5-trichlorophenol as Group D: Not classifiable as to human carcinogenicity due to inadequate human and animal data (U.S. EPA, 1994a). The International Agency for Research on Cancer (IARC) has classified 2,4,5-trichlorophenol as Group 2B: Possible human carcinogen based on limited animal evidence (IARC, 1987a).

